

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

**0 067 914
A1**

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 81302818.0

(51) Int. Cl.³: **H 01 H 85/54**
H 01 H 9/10

(22) Date of filing: 23.06.81

(43) Date of publication of application:
29.12.82 Bulletin 82/52

(64) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: **Chen, Chang Chien**
7, Lane 12, Tsuey Hwa Street
Pan Chiao Shih Taipei Hsien(TW)

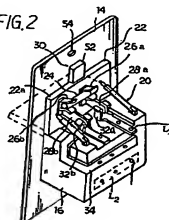
(72) Inventor: **Chen, Chang Chien**
7, Lane 12, Tsuey Hwa Street
Pan Chiao Shih Taipei Hsien(TW)

(74) Representative: **Horton, Andrew Robert Grant et al,**
BOULT, WADE & TENNANT 27 Fumvat Street
London, EC4A 1PQ(GB)

(54) Fuse unit.

(57) A fuse unit in which a fuse 24 is held between conductive sockets 26a, 26b on the inner side of a pivoted plate 22 which is held against a bias 20 constituted by a spring-loaded strut by means of a latch 30. Conductive arms 28a and 28b extend into socket clips 32a and 32b so as to constitute circuit breakers which when the latch is released are opened automatically to isolate the fuse and its terminal socket clips from the electrical supply.

FIG.2



"FUSE UNIT"

This invention relates to fuse units which are primarily intended for use in domestic installation.

5 The object of the invention is to provide a fuse unit adapted to permit the exchange of a tubular fuse without the use of any tools and particularly to make the changing of a fuse a simple and safe operation for those unfamiliar with electrical installations.

10 The invention is based on the provision of a fuse holder which is adapted to hold a tubular fuse within an enclosure and which is biased to move on the release of a latch to expose the fuse and in so moving to withdraw automatically a contact member from at
15 least one circuit breaker disposed electrically in series with the fuse. In a preferred form of the invention the fuse is held between two open spring sockets which are respectively connected electrically in series with a contact arm which in the closed position of the fuse
20 unit is received within a socket so as to constitute one

-2-

of the aforementioned circuit breakers. The holder is preferably in the form of a pivoted plate and a bias for urging the plate to move outwardly from a surround, to expose the fuse, may be constituted by at least one spring-loaded telescopic strut connected between the plate and a member fixed relative to the surround. The aforementioned latch may comprise a spring-biassed slider adapted to engage a recess in the holder or plate, so that the only manual operation required to expose the fuse is movement of the slider.

Preferred embodiments of the invention will now be described in more detail, with reference to the accompanying drawings, in which:

Figure 1 is a front view of one embodiment of the fuse unit;

Figure 2 is a perspective rear view of the unit;

Figure 3 is a top view of the unit;

Figure 4 is a detail of a latch;

Figures 5 and 6 are two views of a spring-bias;

Figure 7 is a front view of a second embodiment of the invention;

Figure 8 is a rear perspective view of the second embodiment;

Figure 9 is a front view of a third embodiment

of the invention; and

Figure 10 is a rear respective view of the third embodiment.

The embodiments which are described in the following have many features in common and like parts are generally denoted by like reference numerals.

In the first embodiment which is illustrated by Figures 1 to 6, the unit 10 includes a surround 14 constituted by a mounting plate by means of which the unit would usually be mounted to lie within a recess in a wall or panel, the front of the mounting plate lying flush with, or slightly protruding from, the surface of the wall or panel. The plate 14 has two holes 54 near its top and bottom, these holes accommodating fixing screws. The plate 14 has three pairs 12a, 12b and 12c of insertion holes for the reception of two-pin plugs. The sockets in which these plugs are received are disposed within an insulating body 16 disposed to the rear of the mounting plate. One socket in each pair is electrically connected to one or other of the conductive strips 34 and L2.

Accommodated within the plate 14 is a movable holder constituted by a pivoted plate 22 which in the closed position of the unit lies flush with the plate 14. The holder 22 is adapted to carry releasably a tubular

-4-

fuse 24 of the common form having conductive terminal caps. In this embodiment of the invention the tubular fuse is held between two socket clips 26a and 26b which serve also as terminals for the fuse. These socket clips are provided on the rear surface of the plate 22 so that in the closed position of the plate 22 the fuse is hidden.

Extending rearwardly from the plate 22 are two conductive arms 28a and 28b in conductive connection with the terminal socket clips 26a and 26b respectively.

10 The arm 28a is, for the closed position of the plate 22, received within a conductive socket clip 32a disposed on the body 16 constituting one power terminal of the fuse unit. An extension of the socket clip 32a is or may be connected to a power line L1.

15 The conductive arm 28b extends into and is received by a conductive socket clip 32b likewise disposed on the body 16. This socket clip is electrically connected to the conductive strip 34. It will be appreciated that in the closed position of the plate 22, fuse 24 is

20 connected between the strip 34, which is connected in common to one of the sockets in each pair, and a terminal of the power supply and that the fuse is disposed electrically in series between two contact breakers each constituted by one of the conductive arms 28a and

25 28b and the respective socket 32a and 32b.

-5-

As will soon be explained in more detail, the plate 22 is urged by a spring-bias 20 to pivot outwardly and thereby to move to expose the fuse, as is shown in dashed lines in Figure 2 and as is shown in Figure 3.

- 5 The movement of the plate 22 to expose the fuse simultaneously withdraws the arms 28a and 28b, which pivot with the plate 22, out of the respective sockets 32a and 32b so as to open the respective contact breakers and isolate the terminals 26a and 26b of the fuse holder
10 from the electrical supply. Then the fuse 24 can be removed and exchanged for a new fuse if necessary.

In the closed position of the plate 22, the plate is restrained from movement by means of a latch 30. This latch is illustrated in more detail in Figure 4.

- 15 The upper, free, edge 22a of the plate 22 has a recess 50 extending lengthwise of the edge. Extending into this recess is a tongue 46 of a slider 52 which is urged downwardly, so as to urge the tongue 46 into the recess 50, by means of a spring 48 disposed between the
20 upper edge of the tongue 46 and part of the plate 14. The tongue and the recess are slightly chamfered so that when the plate 22 is pushed into its closed position the inner side edge of the plate 22 engages the chamfered side 46a of the tongue 46 and moves the
25 tongue 46 upwardly until the plate 22 is in a position

-6-

in which the tongue 46 can be forced into the recess 50 by means of the spring 48. When it is desired to open the fuse unit, the slider 52 is moved manually upwards to release the tongue 46 from the recess 50.

5 Figures 5 and 6 illustrate the spring bias. It is constituted by at least one, and preferably two telescopic struts 36 each of which is pivotally connected to the body 16 and is pivotally connected to the plate 22. In this particular embodiment, the strut comprises
10 a tube 36a which at one end is mounted on a short axle 42 mounted on the body 16, and a second tube 36b which is closed at an inner end, disposed inside the tube 36a. The open, outer end of the tube 36b accommodates a spigot 36c which is pivoted on an axle 44 mounted on
15 the plate 22.

The tube 36a includes a compression spring 38 which bears on the closed end of the tube 36b. The tube 36b includes a compression spring between its inner closed end and the end of the spigot 40.

20 The strut is compressed, as shown in Figure 6, when the plate 22 is in the closed position. When the latch 30 is released, the strut expands, as shown in Figure 5, to force the plate 22 outwardly of the surround 14.

25 Figures 7 and 8 illustrate a different embodiment

-7-

of the invention. This embodiment is generally similar to that already described with reference to Figures 1 to 6, but in this embodiment the fuse unit includes two switches instead of the three pairs of plug sockets.

- 5 Accordingly the unit 60 has a slightly different plate 14, the plate 14 serving to accommodate two switches 62a and 62b. The two switches are connected in common at one side to the conductive strip 34 but at their other sides are connected to respective terminal strips 64b and 64a respectively. Each switch, being connected to the strip 34, is thereby in series with the fuse 24.

- Figures 9 and 10 illustrate a third embodiment, which is in essential operation similar to that already described with reference to Figures 1 to 6. However, 15 in the unit 70 shown in Figures 9 and 10, there are no associated plug sockets or switches; instead, the unit is constructed as a double fuse unit, each fuse having its own holder 22a and 22b, constructed as previously described. The terminal socket clips for the two circuit 20 breakers constitute terminals for the respective fuse units and are connected to one or other of the leads L11 to L14. The embodiment shown in Figures 9 and 10 may be used as part of a master switch, the two fuses being provided each for a respective one of two lines of a supply. 25 Thus for use with a direct current supply, the leads

-8-

L11 and L12 may be the input and output leads for the positive supply and the leads L13 and L14 may be the input and output leads for the negative supply.

CLAIMS:

1. A fuse unit in which a fuse holder (22) adapted to hold a tubular fuse (24) is biased to move on the release of a latch (30) to expose the fuse and in so moving to withdraw automatically a contact member (28a) of at least one circuit breaker (28a,32a) disposed electrically in series with the fuse.

2. A fuse unit according to claim 1 in which the movement of the fuse holder withdraws two contact members (28a,28b) from a respective circuit breaker (28a,32a;28b,32b) between which the fuse is electrically in series when the fuse unit is closed.

3. A fuse unit according to claim 2 in which the contact members (28a,28b) are mounted on and extend from the holder 22.

4. A fuse unit comprising a pivoted holder (22) adapted to lie within a surround (14) and also adapted to hold releasably a tubular fuse (24) which is exposed on outward movement of the holder from the surround, a circuit breaker (28a,32a) arranged electrically in series with the fuse, the circuit breaker including an operating

-10-

member (28a) carried by the holder (22) whereby the breaker is opened and closed as the holder moves outwardly and back respectively, a bias (20) for urging the holder outwardly of the surround and a manually releasable
5 latch (30) for holding the holder within the surround against the force of the bias (20).

5. A fuse unit according to claim 4 in which the surround is a mounting plate (14) within which the holder
10 (22) lies substantially flush when the holder is held by the latch.

6. A fuse unit according to claim 4 or claim 5,
in which the circuit breaker comprises a conductive
15 arm (28a) and a socket clip (32a) positioned to receive the arm.

7. A fuse unit according to any of claims 4 to 6 in which there are two circuit breakers, between which
20 the fuse is electrically disposed.

8. A fuse unit according to claim 7 in which the holder comprises two terminals in the form of socket clips (26a,26b) adapted to receive and be electrically
25 bridged by the fuse.

-11-

9. A fuse unit according to claim 8 in which each circuit breaker comprises a respective arm and socket clip, each arm being in permanent conductive connection with a respective terminal (26a,26b) on the holder (22).

5

10. A fuse unit according to any foregoing claim in which the bias is constituted by at least one spring-loaded telescopic strut (36) pivotally connected between the holder and to a fixed member (16).

10

11. A fuse unit according to any foregoing claim, in which the latch (30) comprises a spring-biased slider adapted to engage a recess in the holder.

15

12. A fuse unit according to claim 11 in which the latch includes a tongue (46) having a bevelled edge (46a).

1/2

FIG. 1

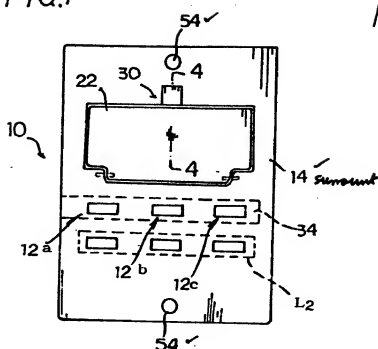


FIG. 3

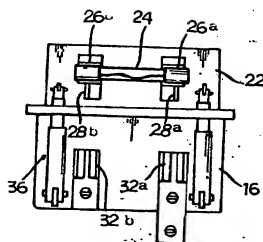


FIG. 2

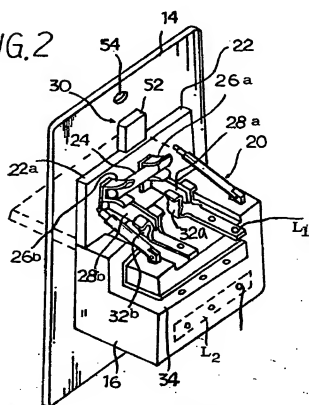


FIG. 4

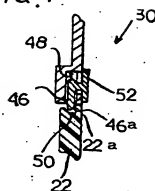


FIG. 5

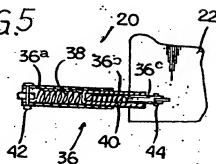


FIG. 6

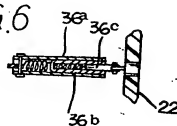


FIG. 7

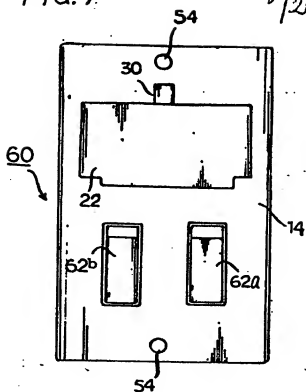


FIG. 8

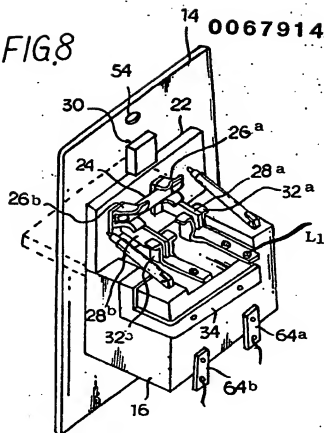


FIG. 9

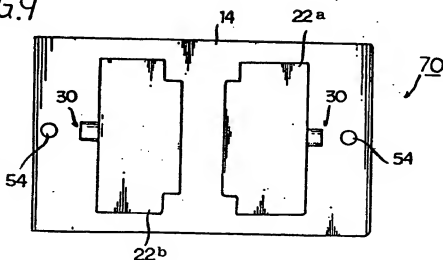
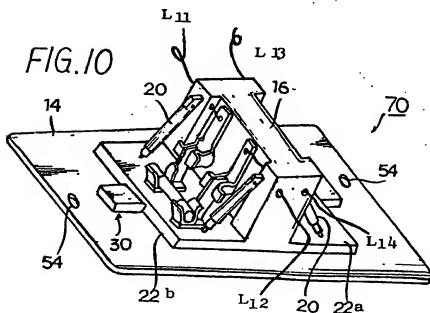


FIG. 10



0067914



European Patent
Office

EUROPEAN SEARCH REPORT

0067914

Application number
EP 81 30 2818

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. 7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
XY	FR - A - 2 057 573 (IND. ELECTR. DE LA SEINE) * Figures 32-40; page 6, line 36 - page 8, line 20 * --	1-5, 7, 11, 12	H 01 H 85/54 9/10
Y	US - A - 2 334 810 (TRUMBULL EL. COMP.) * Figure 7; page 2, lines 41-69 * --	1, 3-5	
Y	GB - A - 824 260 (FARISH) * Pages 1-3 * --	1-9	TECHNICAL FIELDS SEARCHED (Int. Cl. 7)
Y	US - A - 1 885 111 (HUSH) * Page 1, line 64 - page 2, line 26; page 2, lines 45-60 * --	1-9	H 01 H 85/00 9/00 21/00 23/00 H 01 R H 01 H 31/00
A	GB - A - 844 487 (CLANG) * Whole document * ----	1, 4, 1	
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons
<input checked="" type="checkbox"/> The present search report has been drawn up for all claims			&: member of the same patent family, corresponding document
Place of search	Date of completion of the search	Examiner	
The Hague	09-03-1982	DESMET	